Serial No. 09/598,890

IN THE SPECIFICATION:

Page 7, first full paragraph, please amend to read:

The basic required components for such a microchip system are shown in Fig. 1. They are basically divided into systems that have a material flow 1, and systems that represent an information flow 2 that occurs during an experiment. In the area of the material flow 1, means are necessary to supply 3 and transport 4 substances on the chip, and means are required to treat or pretreat 5 the investigated substances. Furthermore, sensors are required for detection 6 of the results of an experiment. The arising flow of information is essentially for controlling the transport of substance on the chip using, e.g., control electronics 7. In addition, a flow of information occurs while processing the signals in the signal processing step 8 of the detected measured results, and especially while evaluating or interpreting them 9. Additional needed transport steps 4', 4'', and 4''' are also shown.

Page 6, first full paragraph:

In addition, micromechanical or micro-electromechanical sensors are presently being considered for use in the cited area of microfluid technology, e.g., micromechanical valves, motors or pumps. A corresponding perspective on possible future technologies in this field is provided by a relevant article by Caliper Technologies Corporation.

Page 9, second full paragraph:

In addition, a first coder can be on the supply element for identification that interacts with a corresponding second coder on the corresponding supplier. This measure makes the device according to the invention particularly safe to use since it effectively prevents a supplier

incompatible with the supply element from being accidentally used or installed. To further increase operational reliability, a magnetic sensor (especially a Hall sensor) can be provided to identify the supply elements, or a shut-off device or warning device that works with the sensor can be provided.

Page 11, first full paragraph:

The substances to be investigated (possibly along with the required reagents for the respective experiment) are first fed to a supply area of the microchip where the material is to flow. Then the substances are moved or transported 4 on the microchip (e.g., by means of electrical force in the case of ionized substances). Both the supply and the movement of the substances are effected by suitable control electronics 7 as indicated by the dashed line. In the present example, the substances are pretreated 5 before they are subjected to the actual experiment. They can be, e.g., pre-heated by a heater, or pre-cooled by a suitable cooling device to precisely reproduce the thermal test conditions. Of course, the temperature of a chemical experiment normally substantially influences the experimental kinetics. As indicated by the arrow, this pretreatment can also be sequential, whereby a pretreatment step 5 and another transport step 4' are correspondingly triggered. The cited pretreatment is particularly useful for separating substances so that only specific components of the starting substance will be available for the respective experiment. Basically, both the amount of substance (quantity) as well as the rate of the substance (quality) can be determined by the described means of transport. In particular, by precisely setting the amount of substance, the individual substances or substance components can be precisely dosed. The last-cited procedures are also preferably controlled by means of the control electronics 7.

Page 11, second full paragraph:

The actual experiment may occur after several pretreatments; the experimental results can be detected 6 at a suitable detection point on the microchip. The means of detection are preferably optical, e.g., a laser diode is used together with a photocell, or a conventional mass spectrometer. The resulting optical measurement signals are sent to a signal-processing device for processing signal in step 8 and then to an evaluation unit (e.g. a suitable microprocessor) for interpretation 9 of the measurement results.

Page 14, second full paragraph:

Optional recesses 54 can be provided to accept substances, especially reagents. In addition, a second assembly 55 is provided that contains the required supply device 56 for operating the microchip 52. By suitably miniaturizing the required components, the supply device 56 preferably represents a microsystem that provides the required electrical voltage or compressed medium via corresponding electrodes 58 (or lines 58 for a pressure supply system) in the form of a cartridge that can be inserted in the assembly 55. If the microchip is supplied with electricity, the electrical voltage supply can be miniaturized using conventional integrated circuitry; if pressure is supplied, the miniaturization can be provided by corresponding techniques familiar in the fields of modern laboratory technology or micromechanics. The supply containers for the compressed gas can also be integrated since, as mentioned, the required gas volume is in the picoliter range.

Page 15, first full paragraph:

In the shown exemplary embodiment, the supply element according to the invention has electrical linkages 60 or connecting channels that bridge the electrodes 58 or the channels of the supply device 56 and the recesses 53 of the microchip. On one hand, the bridging serves to prevent wear and soiling of the supply device 56 electrodes that arises when the microchip is contacted such that the supply element basically assumes this function as a disposable product. As shown in the present exemplary embodiment, the supply element can also serve to spatially adapt the supply device 56 electrodes to the respective surface or spatial

arrangement of the microchip's electrode surfaces. The entire measuring and operating device can be advantageously adapted to a special microchip layout just by exchanging the supply device 56 and/or the supply element 57. In particular, by exchanging the entire supply device, the handling device can be quickly and easily adapted to different test series or types of operation, as for example when changing from an electrical to pressure supply of the microchip.

Page 16, first full paragraph:
In the embodiment of Figs. 4a1 and 4b1, the supply lines (hollow tubes or hollow channels) 70 which transfer substances are designed as capillaries or cavities that extend above the interface element with reference to the side surfaces of the interface element. The supply lines 70 are sealed with a chemically resistant substance, such as wax, filling compound, etc. at their ends 79 and hence can be sealed so as to be air- and gas-tight.

Page 19, first full paragraph:
In addition, first coders 100, 100' are provided in the present exemplary embodiment that operate according to the pin/hole principle to identify the supply element, and they work together with a corresponding second coders 101, 101' on the supply equipment. The coders 100, 100', 101, 101' ensure that only a supply element compatible with the corresponding supplier can be used or, respectively, inserted in the cartridge 80. In particular, to further increase operational reliability, a magnetic sensor (not shown), especially a Hall sensor, can be provided to identify the supply element, and a shut-off device or warning device that works with the sensor can also be provided. Let it be stated that in addition to the shown embodiment that uses a pin and hole, other coders can be used such as electrical/magnet coding or the recognition of corresponding ID chip cards, or an optical coding, e.g. a color code, bar code, etc.